CLAIMS

What is claimed is:

1. A rotary electric machine comprising:

a frame;

a stator whose stator-slot number Ns is 12;

a rotor whose rotor-pole number Np is 8, said rotor disposed in a space inside said stator; and

given that frame thickness $T(\theta)$ at mechanical angle θ, with respect to a reference line that connects the inner circumferential center of the frame with an arbitrary point other than the center, around the center is circularly expanded in the Fourier series as expressed by equation 1

$$T(\theta) = \sum_{n=0}^{\infty} T_n \cos(n\theta + \phi_n) \qquad (1)$$

(wherein n is 0, 1, 2, 3, ..., T_n is the magnitude of the n-th component of the frame thickness when $T(\theta)$ is expanded in the Fourier series as in equation 1, and ϕ_n is the phase),

and that the difference between the stator-slot number Ns and the rotor-pole number Np is k (= | Ns – Np |),

stress-relieving spaces provided in portions of said frame in an arrangement that does not have 90-degree mechanical angle rotational symmetry, in such a way that the sum P of inclusion ratios for the k-th component T_k and the Np-th component T_{Np} that are the Fourier series expansion coefficients for the frame thickness $T(\theta)$ expressed by equation 2

$$P = \left(T_k + T_{Np}\right) / \sum_{n=0}^{\infty} T_n \times 100\ [\%] \qquad (2)$$

falls under 12%.

2. A rotary electric machine as recited in claim 1, wherein effective frame thickness is replaced with $2T_0$ when the frame thickness $T(\theta)$ is not smaller than $2T_0$,, and then the effective frame thickness, instead of said frame thickness, is circularly expanded in the Fourier series, where T_0 is the average frame thickness.

3. A rotary electric machine as recited in claim 1, wherein said stress-relieving spaces are at least either stress-relieving grooves provided on the outer and inner circumferences of the frame, or stress-relieving holes provided in the frame.

4. A rotary electric machine as recited in claim 1, wherein at least a portion of the cross-section of said stress-relieving spaces in a plane orthogonal to the center axis of the frame inner circumference is shaped in a curved line.

5. A rotary electric machine as recited in claim 1, wherein said stress-relieving spaces mixedly include holes that are drilled through the frame member and holes not drilled therethrough.

6. A rotary electric machine as recited in claim 1, wherein, the contour of said frame in a cross-sectional plane orthogonal to the center axis of the frame inner circumference is approximately square.